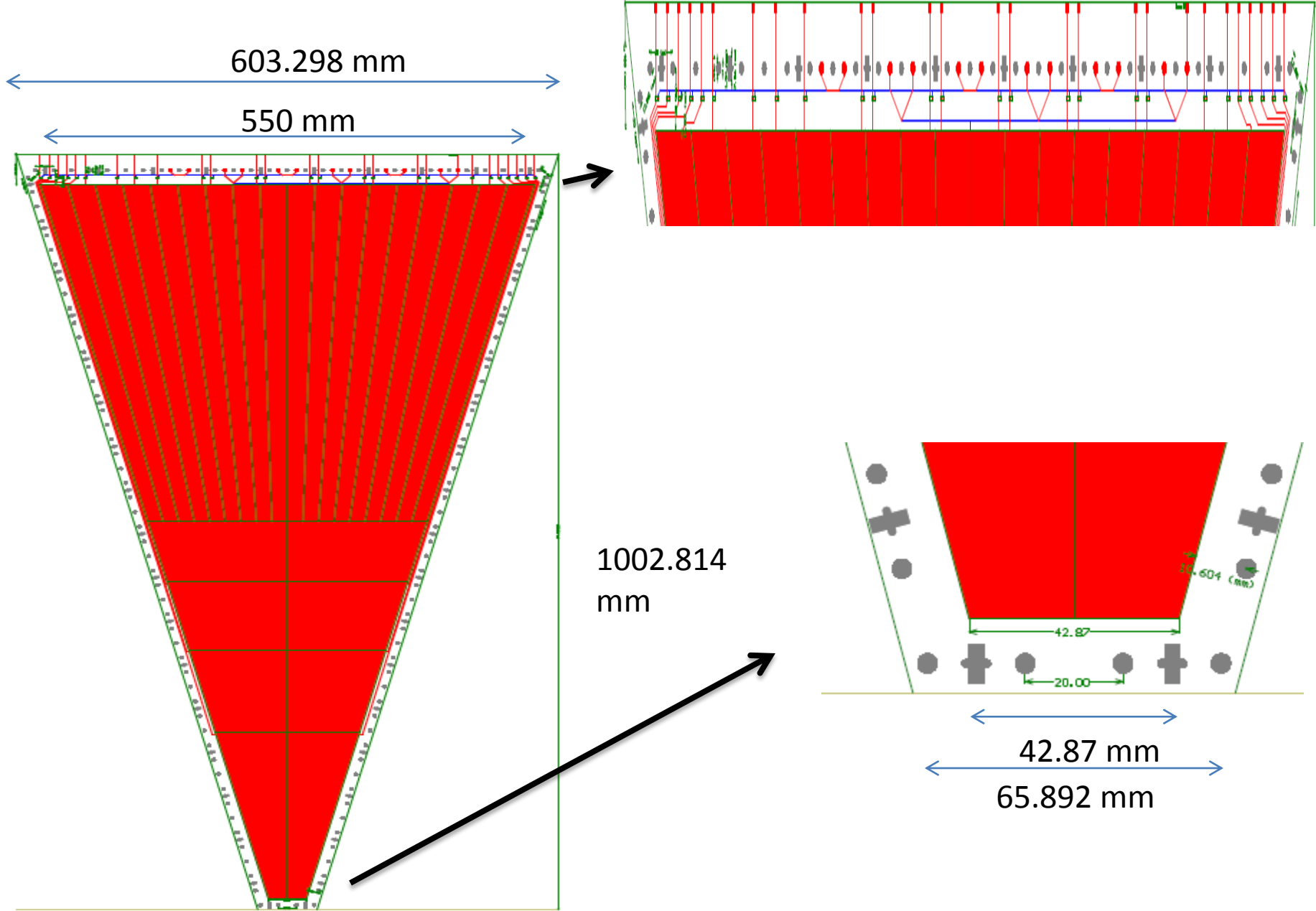


# Common GEM foil design discussion

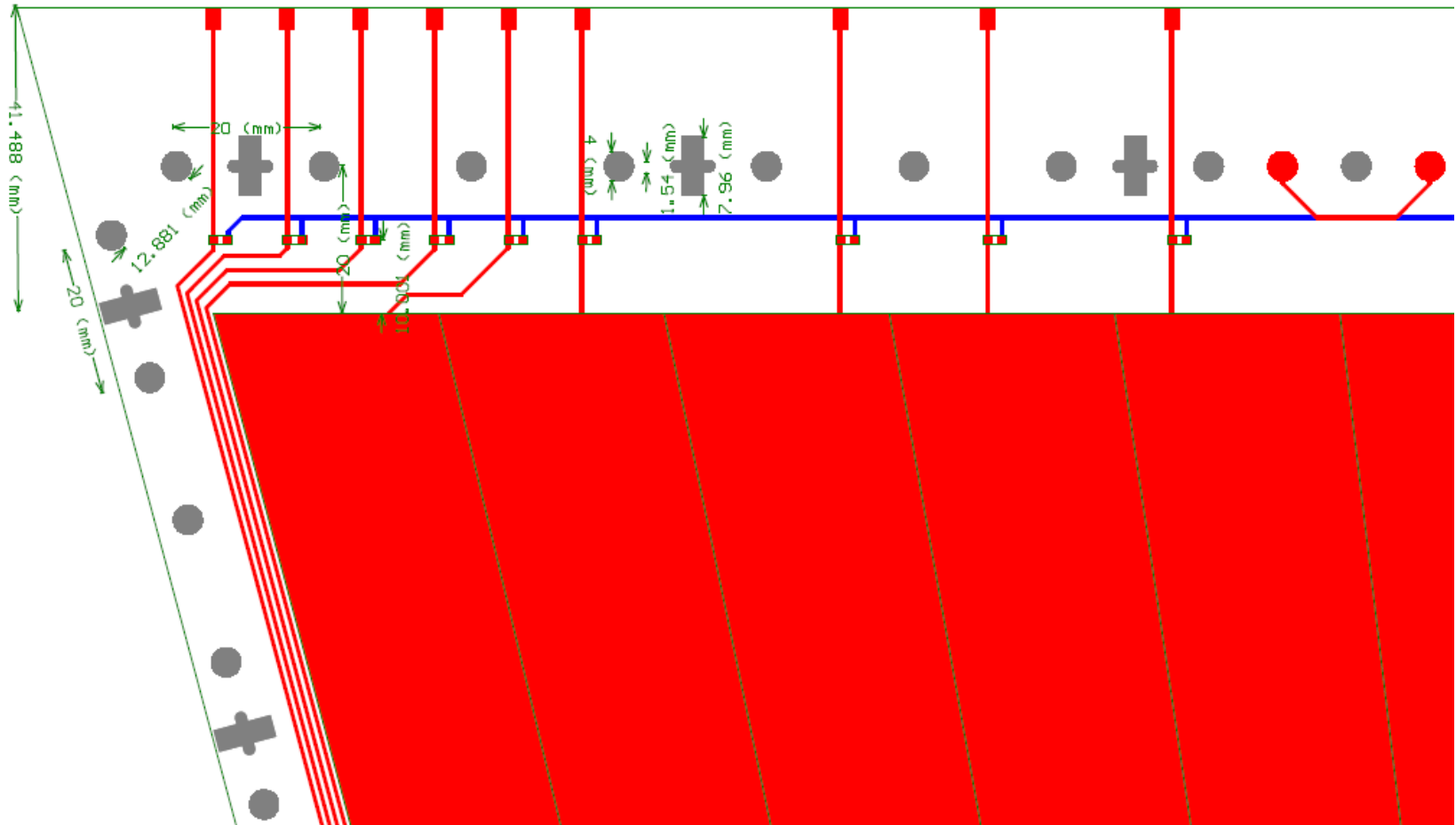
Aiwu Zhang

2015-03-23

# Overall dimensions



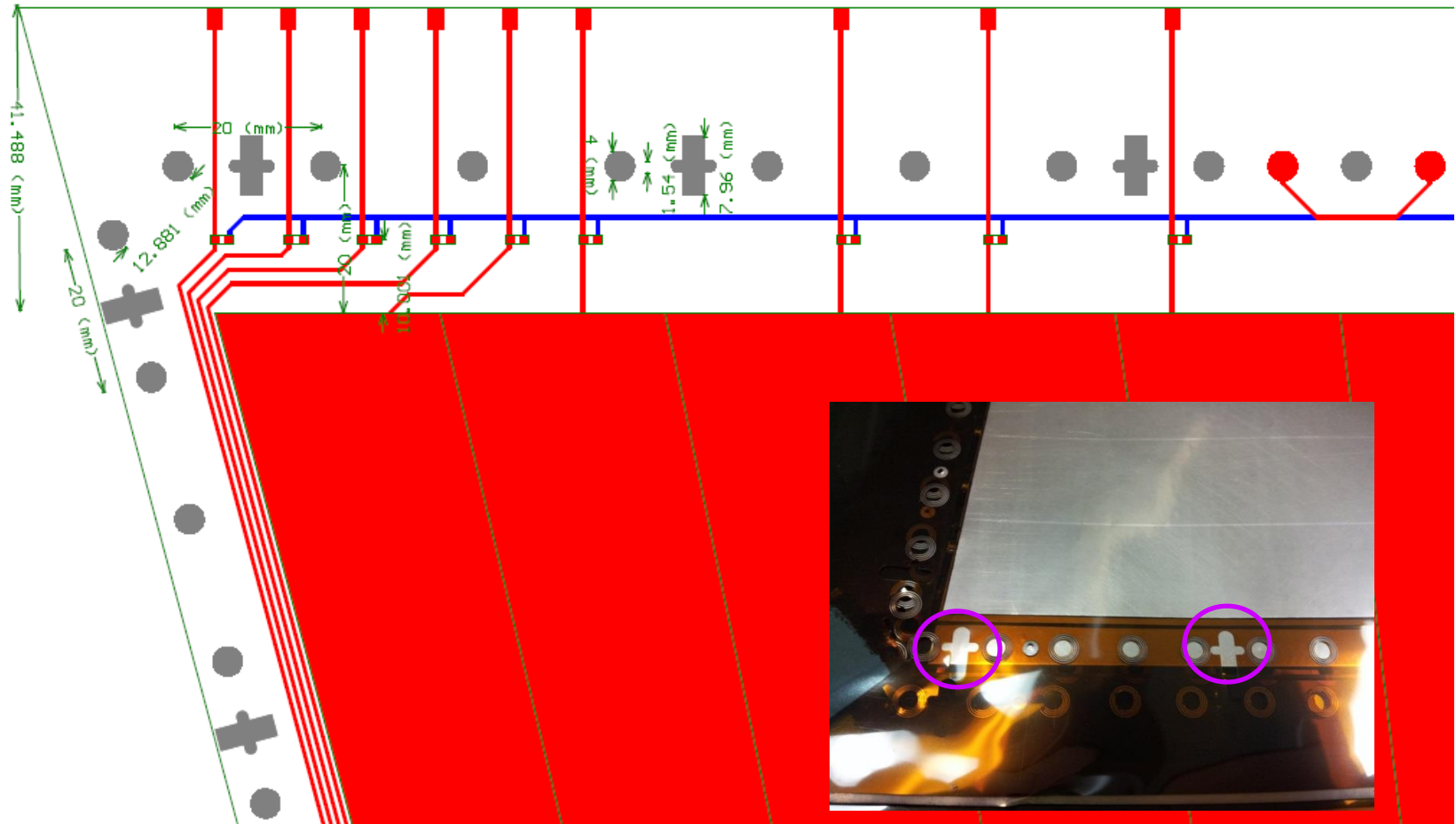
# Details at the top-right corner



Items for comments:

**Gray circular holes** for mechanical assembling. Both UVa and FIT will use the same holes. Hole size 4 mm, pitch 20 mm overall except the two corners. **Total 133 holes** ( $29 + 51 \times 2 + 2$ ). Distance from top/bottom/side hole center to copper edge: 20mm/9mm/10.6mm

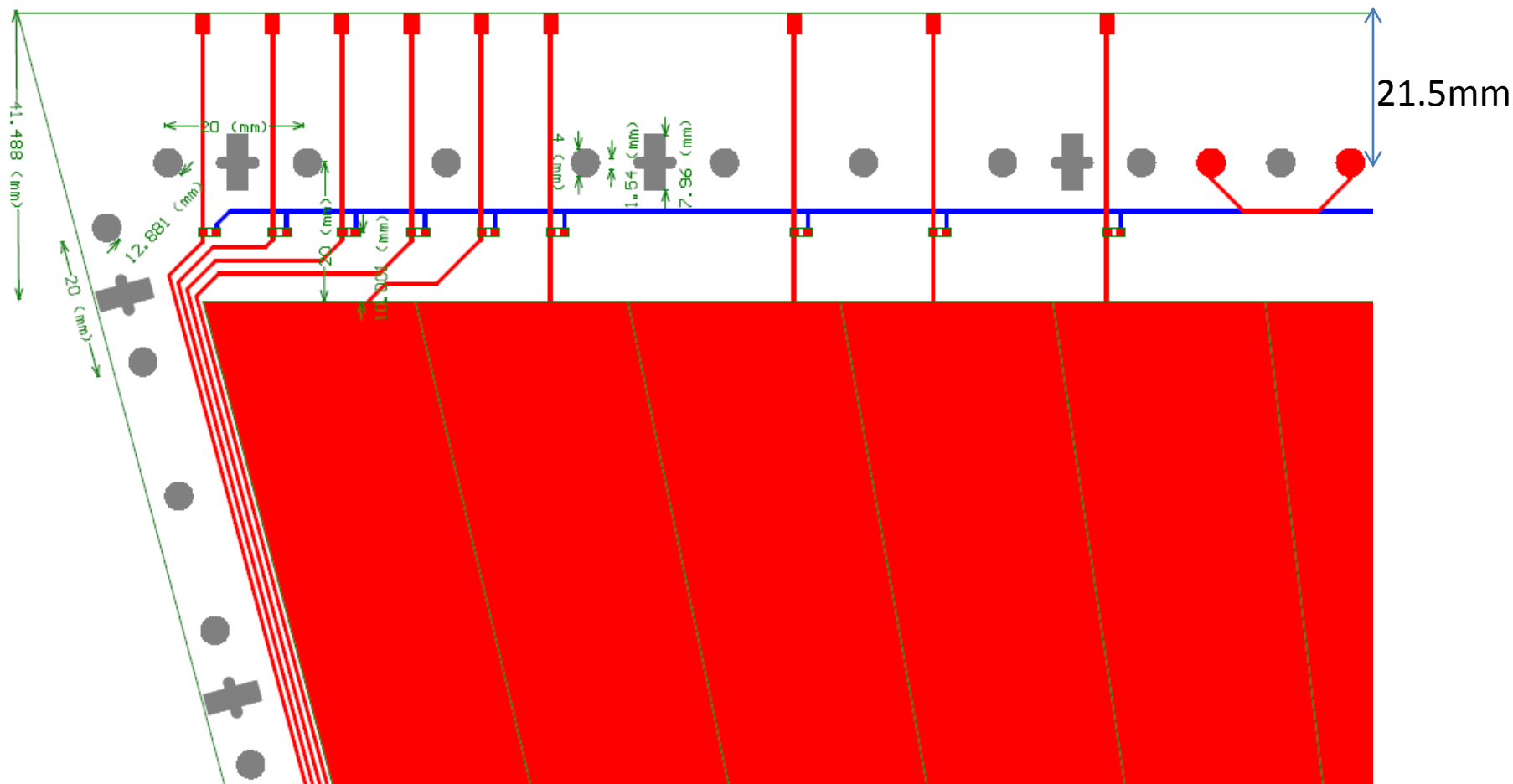
## Details at the top-right corner



Items for comments:

**Gray cross holes** for FIT stretching. Lengths in X=6mm and Y=8mm (the min.), pitch 60 mm on top and sides, 40 mm on the bottom. Total 46 of these holes ( $10+17*2+2$ ).

# Details at the top-right corner



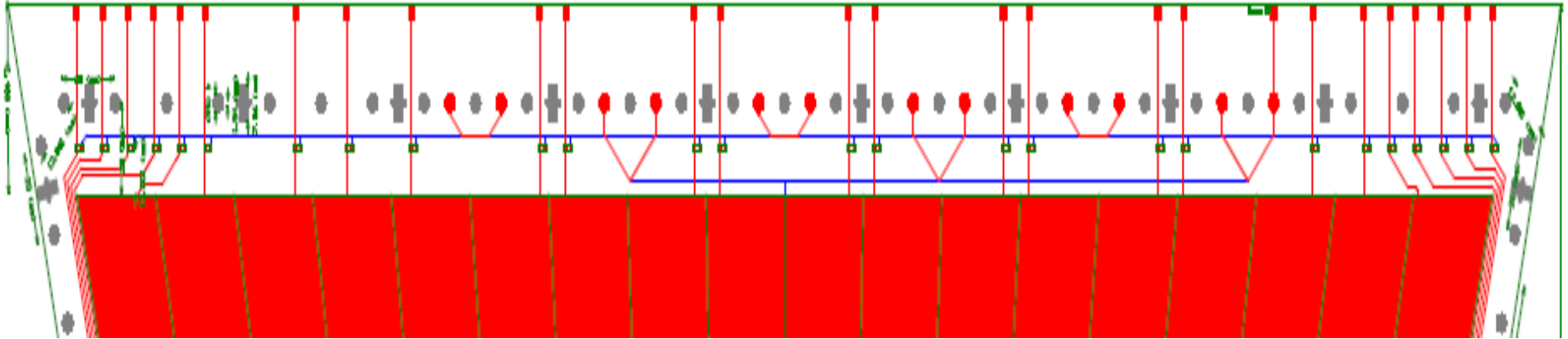
Items for comments:

**FIT protective resistors.** 3.2 mm by 1.2 mm; distance to copper edge id 10 mm.

HV traces for UVa connect to resistors pads directly; the HV traces are routed to outside, can be arranged (in a compact way) as required. From gray hole center to top-most line it is 21.5 mm, for FIT 4 mm is good.

# Other details

↓ Uva bottom HV



**FIT HV pads** (the red pads in between those gray holes): 4 mm size. They are all on the top surface but 6 for top and 6 for bottom.

**Two common HV lines** (the blue color) on the bottom surface. The upper/lower one is for HV on the top/bottom. Their distance is 10 mm.

**Vias:** 50 um size; one via on each resistor, from their the resistor will be connected to FIT HV pads for the top surface; three vias on the lower HV line for connecting to FIT HV pads for the bottom surface; also three vias on the upper HV line for connecting to FIT HV pads for the top surface. Total number of vias is  $26+3+3=32$

HV connection to the bottom for Uva, in this design, it is (on the top surface) connected to one FIT HV pads for bottom. Can be moved.

HV trace width 0.5 mm, pitch 1mm on the side, >1mm for others.

# Summary

- Regarding to the segmentation on the foil, currently it has 26 sectors. The gap between sectors is 0.1 mm. Is this too small?
- The common GEM foil design is almost clear/and ready to the groups. The Temple U. group is expected to give feedback early this week.
- Tech-Etch suggests to use a vias as small as possible on GEM foil. It can do vias, but with more costs. It can do surface mounting (for resistors) but not for this large size foil.